Archaeological Resources Assessment for the Proposed Kingdom Community Wind Project, Lowell, Orleans County, Vermont

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Project Description

Green Mountain Power Corporation (GMP) is proposing the Kingdom Community Wind, Project, Lowell, Orleans County, Vermont (Figure 1). The proposed project will build a wind powered electric generating facility in Lowell, Vermont. The proposed project will provide up to 63 megawatts of electrical capacity using wind turbines located along an approximately 3.2 miles (5.1 km) section of privately owned ridgeline of the southern Lowell Mountain range in Orleans Country, Vermont (see Figure 1). Access to the project area is proposed along road that will be constructed from VT Rte 100 in the west, running along the northern edge of the proposed lay-down area before winding its way upslope to the ridge line, at which point it will intersect north and south along the ridgeline (see Figure 1). It is expected that the proposed Kingdom Community Wind project will connect to the existing VEC electrical system in Lowell.

Collector Line

From the intersection of the proposed access road and VT Rte 100, the proposed collector system will run north along VT Rte 100 to the VEC Lowell Substation northeast of the intersection of VT Rte 58 and VT Rte 100 (Figure 2). The collector line will be run in a combination of existing and new right-of-way (see Figure 2).

Substation Upgrades

Both the VEC Lowell#5 and Jay #17 substations will be rebuilt within the existing footprint of the substations. A step-up substation will be constructed in the location of the maintenance building area (see Figure 1).

Transmission Line

The 10.4 mile transmission line between the VEC Lowell substation and the VEC Jay 17 substation located southeast of the intersection of State Route 242 and Cross Road will be upgraded (see Figure 2). The upgrade will involve several new sections of right-of-way to bring the line roadside where desirable and address existing right of way infringements from existing structures. The new line will be built in a similar configuration to the existing line single pole construction. The transmission line will continue north 2 miles from the Jay 17 substation along the existing distribution right-of-way east of Cross Road to the existing 46kV transmission line at the intersection of State Route 105 and Cross Road. From this intersection point west, the 46kV line will be reconductored to a new 46kV switching station (Jay Tap Switching Station) being constructed by VEC as a separate project from the Kingdom Community Wind project.

The University of Vermont Consulting Archaeology Program (UVM CAP) conducted an Archaeological Resources Assessment (ARA) of the proposed project under Section 248. The ARA study investigated the historic background of the area to determine whether any historic period sites may exist within the proposed project area. In addition, a site inspection was carried

out over several days to investigate the degree of archaeological sensitivity within the proposed project elements, including the proposed turbine locations and connecting roads, access roads, laydown areas, and along the transmission line. The field inspection and background research identified several areas as archaeologically sensitive for precontact era Native American sites. The proposed laydown area was determined to be archaeologically sensitive, while several discrete spots along the transmission line likely are archaeologically sensitive, but will require a return visit when ground visibility is better.

Study Goal

The goal of an ARA (or "review") is to identify portions of a specific project's Area of Potential Effects (APE) that have the potential for containing precontact and/or historic sites. An ARA is based on "background search" and a "field inspection" of the project area. For this study, reference materials were reviewed following established guidelines. Resources examined included the National Register of Historic Places (NRHP) files; the Historic Sites and Structures Survey; and the USGS master archaeological maps that accompany the Vermont Archaeological Inventory (VAI). Relevant town histories and nineteenth-century maps also were consulted. Based on the background research, general contexts were derived for precontact and historic resources in the vicinity of the study area.

Prehistoric Archaeological Site Potential

A review of the state's Vermont Archaeological Inventory (VAI) indicates that no known precontact Native American archaeological sites exist within the proposed project area or within 5 km of the Lowell Mountains. Considering that the north-south trending East Branch of the Missisquoi River, which constitutes one of the headwaters of the Missisquoi River, is located to the immediate west of the Lowell Mountains and the Black River to the east, it is unlikely that Native Americans did not occupy the area at some point in Vermont's precontact period. The lack of known precontact Native American site in the area likely reflects minimal private or federal-sponsored development in the area that would require regulatory archaeology studies. At over 3000 ft asl, the Lowell Mountains are the most prominent feature in the landscape for many tens of miles to the east and west. In addition, East Branch, Ace Brook and Truland Brook are all headwaters of the Missisquoi River and all are formed by draining the western slopes of the Lowell Mountains. As a result, it is likely that these brooks contain evidence for considerable precontact era human occupation along their banks, as they represent to the upper limits of the Missisquoi River thoroughfare and natural migration routes for big game that likely were hunted.

Historic Archaeological Site Potential

The closest known historic period archaeological site is VT-OL-58, located 4 km east of the Lowell Mountains along the banks of the Black River. This site represents the remains of a farmstead in the area. The site was identified from the remaining cellar hole, foundation stone and stone lined well. Closer to the proposed project area, no properties within the Town of

Lowell have been listed on either the National or State Register of Historic Places. No structures are located within the proposed project area as depicted on the historic 1925 USGS map (Figure 3). The steep slope throughout much of the proposed project parcel makes it unlikely that any historic properties exist there. Nonetheless, the northern and northeastern edges of the Lowell Mountain range are bordered by the Bailey Hazen Road, which connects the town of Albany to Irish Hill Road in the northwest. The Bailey Hazen Road was an important military road connecting the Connecticut River Valley with Canada, built primarily to move troops northwards in defense of any attacks by Canada in the 18th century. The Bailey Hazen Road will be avoided by the proposed project as currently proposed. It is recommended that this historic road be avoided if project plans change at some point in the future.

Field Inspection

A field inspection of the proposed project's APE was undertaken on November 10 and 18, and December 1, 2009 by Dr. Charles Knight, Assistant Director of the UVM CAP. On January 15, 2010, Knight, and Charlie Pughe of Green Mountain Power, visited to the project area to inspect the Collector and Transmission line alignments along VT Rte 100. As part of the desk review in preparation for the field inspection, the UVM CAP utilized the Vermont Division of Historic Preservation's (VDHP) predictive model for identifying precontact Native American archaeological sites. No known Native American sites exist within the proposed project area. The project area attained a score of 30 on the VDHP Environmental Predictive Model for Locating Precontact Archaeological Sites, due to the location of various project elements within 180 m of the East Branch (of the Missisquoi River), within 90 m of several intermittent streams, within 90 m of the confluence of intermittent streams, and within 90 m of numerous heads-of-draw. All of these water features, except the East Branch, are located along the western slopes of the Lowell Mountain Range. The digital Geographic Information System (GIS) application of this predictive model demonstrates that four overlapping sensitivity factors are located within the general project area. These factors are: Drainage, Wetland, Head-Of-Draw, and Level Terrain. The factors of Wetland and Level Terrain were only found in the lowest portion of the project area, where a Laydown Area is proposed next to the East Branch of the Missisquoi River (see Figure 1).

Several areas of archaeological sensitivity were identified during the field visits. The largest archaeologically sensitive area encompasses the proposed Laydown Area adjacent to VT Route 100 (Figure 4). The proposed Laydown Area is located on a level terrace overlooking the East Branch drainage to the west and is bordered by a tributary of this drainage to the south. Several soil probes taken within this landform during the field visit indicated intact sandy soils below a 10 in thick plowzone. This landform represents one of the only level terraces in this section of the project area, as the East Branch drainage is bounded by steep slope on either side to the immediate north and south of this location (see Figure 4). As a result, it represents a natural occupation location for precontact Native American travelers following the East Branch north-south. The ridge tops of the Lowell Mountains, where the wind turbines will be erected, are hummocky with long stretches of exposed bedrock and steep slopes on either side. The

proposed access road will run along the northern edge of the proposed lay-down area before winding its way upslope to the ridge line, at which point it will intersect north and south along the ridgeline. The proposed access road will be new construction and will typically be 24' feet in width, although it may be wider in places to allow turning radiuses for specialized transportation equipment necessary to move the turbine components to the site. Portions of the access road within the parcel of the Laydown Area are archaeologically sensitive (see Figure 4).

In addition to the Laydown Area, several discrete portions of the transmission line north to Jay are archaeologically sensitive. These areas are typically located on ancient terraces overlooking the upper valley of the Missisquoi River (see Figure 2). Since the proposed transmission line poles will be placed within the existing transmission line corridor or closer to VT Rte 100 than the existing power line poles or on slope, the vast majority of the APE of the proposed transmission line alignment is not archaeologically sensitive. Nonetheless, several landforms were identified as archaeologically sensitive that may be disturbed by the construction of new transmission line poles. These landforms will have to be revisited under better weather conditions to determine exactly how many pole locations will disturb these archaeologically sensitive areas. However, based on a January 15, 2010 inspection of the line, it is expected that a dozen, or less, proposed transmission line pole placements will fall within archaeologically sensitive areas. The proposed locations of the new and existing substations are not archaeologically sensitive.

Conclusions

Proposed turbine areas along the Lowell Mountain Range ridgeline, a proposed access road and maintenance shed along its western slopes, a Laydown Area, the alignment of the collection and transmission lines and the areas of new and existing substations were inspected by the UVMCAP. The locations of the proposed turbines and the upper portion of the access road are steeply sloped and/or characterized by hummocky terrain with extensive bedrock outcrops. No exposures of stone suitable for tool making were identified anywhere in the project area. In addition, no areas suitable for habitation were identified along the ridgeline of Lowell Mountain or on its slopes. The proposed maintenance shed is in a location that has been extensively disturbed by historic activities. Therefore the proposed turbine, upper portion of the access road and maintenance shed locations, as currently designed, will not affect sensitive archaeological areas. However, the level terrace adjacent to VT Route 100 that overlooks the East Branch drainage upon which the proposed Laydown Area and the lower portion of the access road are located was identified as archaeologically sensitive. In addition, several discrete areas along the alignment of the new Collector and transmission lines north of the Laydown Area to Jay were identified as archaeologically sensitive. These landforms will have to be revisited to better determine the exact location of the sensitive areas, since they were first identified at a time of considerable snow cover. As a result, a Phase I site identification survey is recommended to test these archaeologically sensitive areas for the presence of precontact Native American sites, unless these areas can be avoided by the proposed project. However, any new locations used to avoid these archaeological areas also will require further archaeological inspection before they

can be disturbed. No historic period archaeological sites were identified during the site inspection or through historic background research.

In sum, the proposed project will disturb one large and several small discrete areas of archaeological sensitivity. If these areas cannot be avoided, a Phase I site identification survey is recommended for them. The Phase I study will entail test pits excavated systematically along linear transects in the Laydown Area. Sensitive areas along the Collector and Transmission lines will be tested by excavating test pits within a "box" of 5 test pits per pole location, as has been carried out elsewhere in similar circumstances, such as archaeological testing for electric power lines. The Phase I study could be conducted in the spring or summer of 2010, soon after the ground has thawed. If archaeological sites are identified during the Phase I study, then either avoidance of the site or a Phase II site evaluation, which involves more intensive testing of the identified site, will be recommended. The object of the Phase II study is to evaluate the significance of the identified site, which includes determining the site size, age, and contents, for example. A significant site is defined as one that is eligible for inclusion on the National Register of Historic Places. If the site is determined not to be culturally significant then no more archaeological work is recommended. If, however, the site is determined to be culturally significant, then a Phase III data recovery is recommended if the site cannot be avoided. A Phase III data recovery study is the final phase of archaeological study possible. The goal of the Phase III is to recover a sample, usually more than 50%, of the site through intensive excavation, opening up a much larger area of the site that in previous phases, since the significant site will be destroyed by the proposed project. Any changes to the currently proposed plans, such as additional access roads or changes to their alignment, a rearrangement of wind turbines, new staging areas or the additional of elements such as generators or transformers, etc., will require additional archaeological review.

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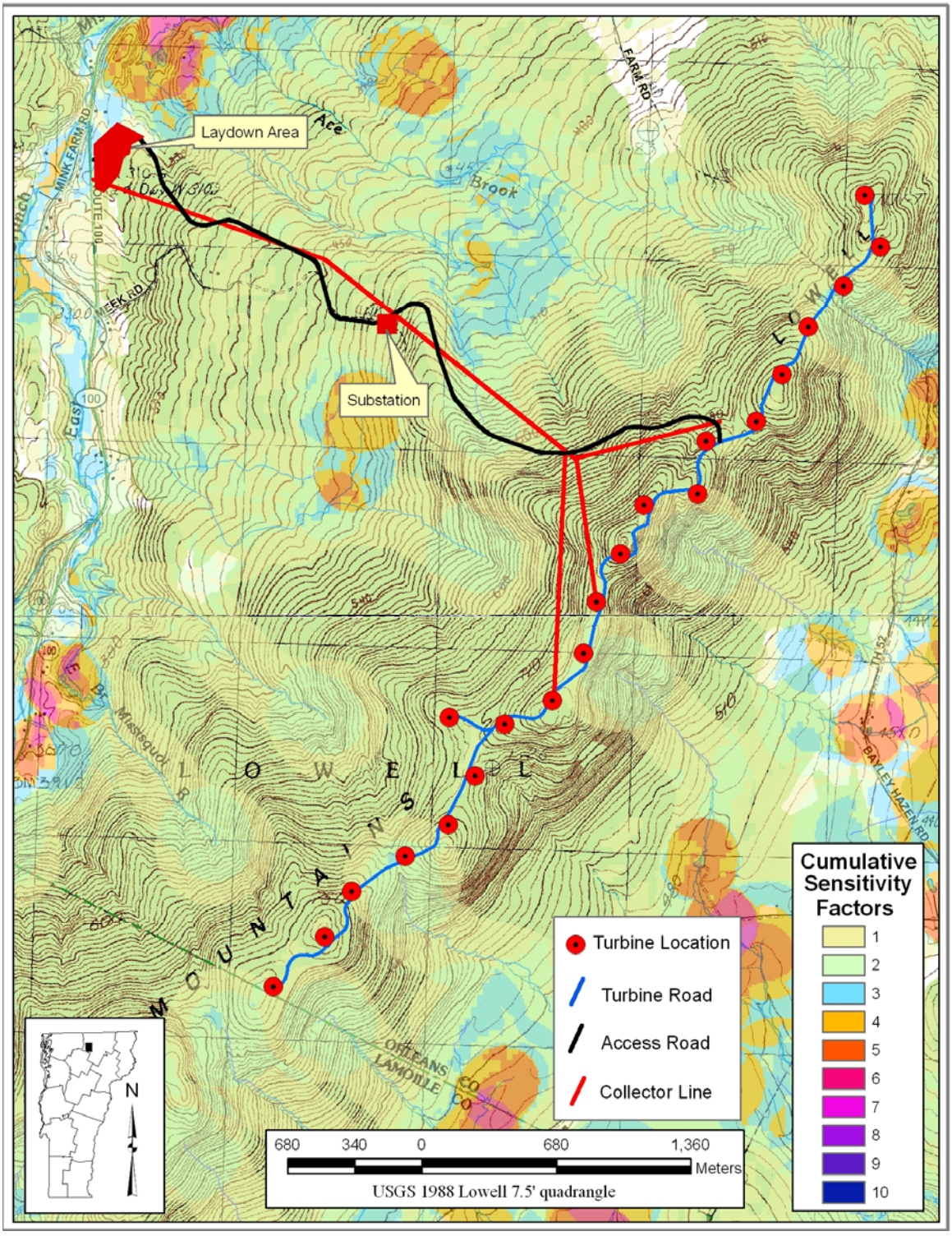

Figure 1. Map showing the location of the proposed Kingdom Community Wind Project, Lowell, Orleans County, Vermont.

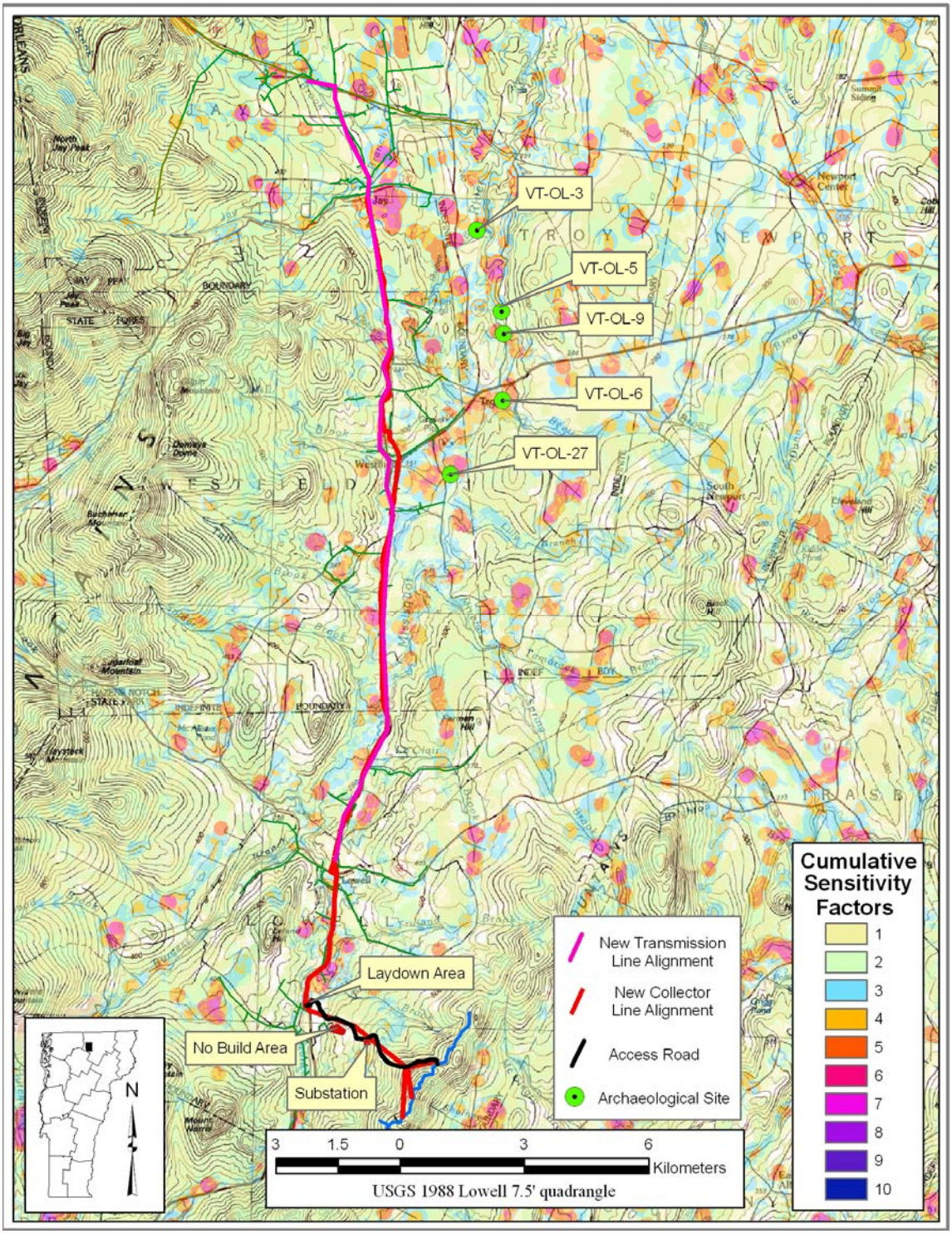

Figure 2. Map showing the location of the proposed conductor and transmission lines, in relation to known archaeological sites and archaeological sensitivity for the proposed Kingdom Community Wind Project, Lowell, Orleans County, Vermont.

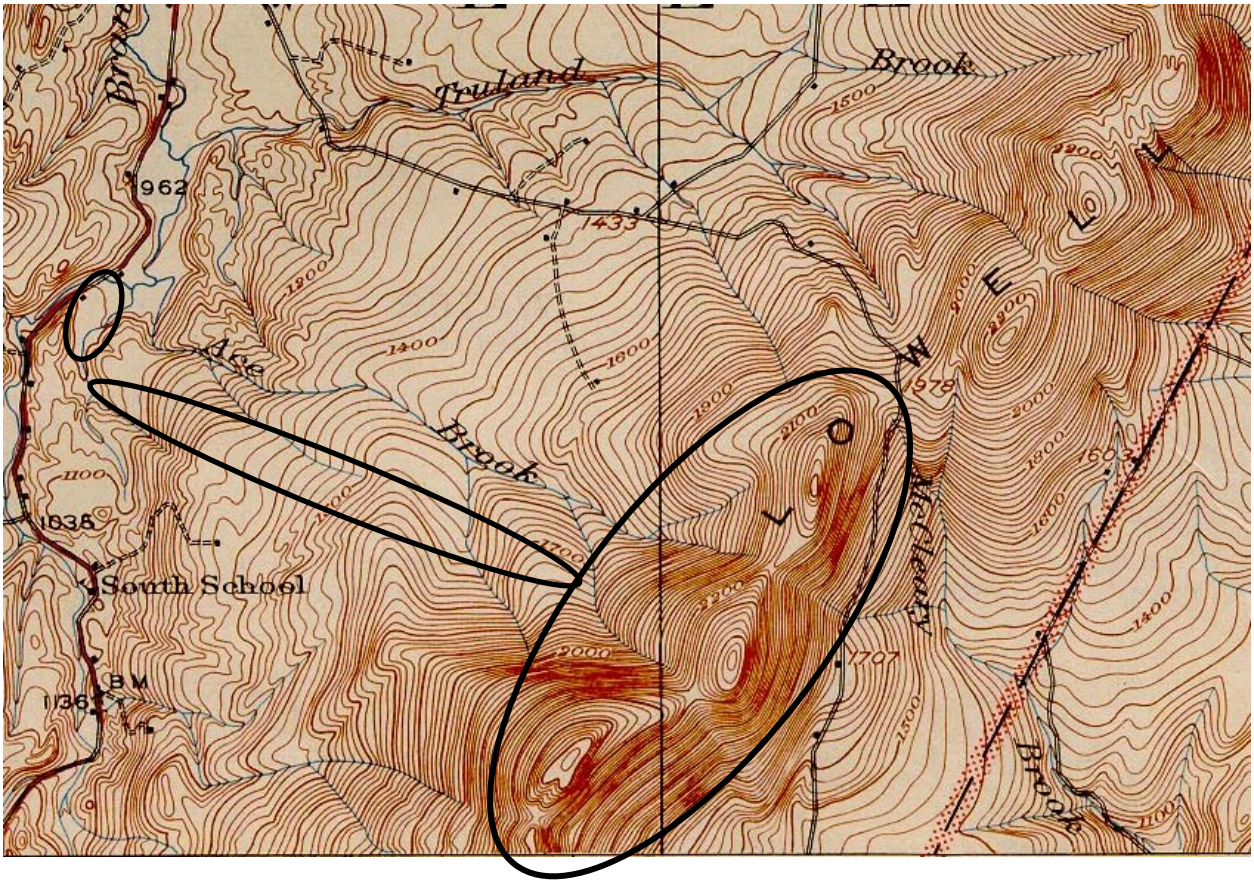

Figure 3. Historic 1925 USGS map showing the location of the proposed Kingdom Community Wind Project, Lowell, Orleans County, Vermont.

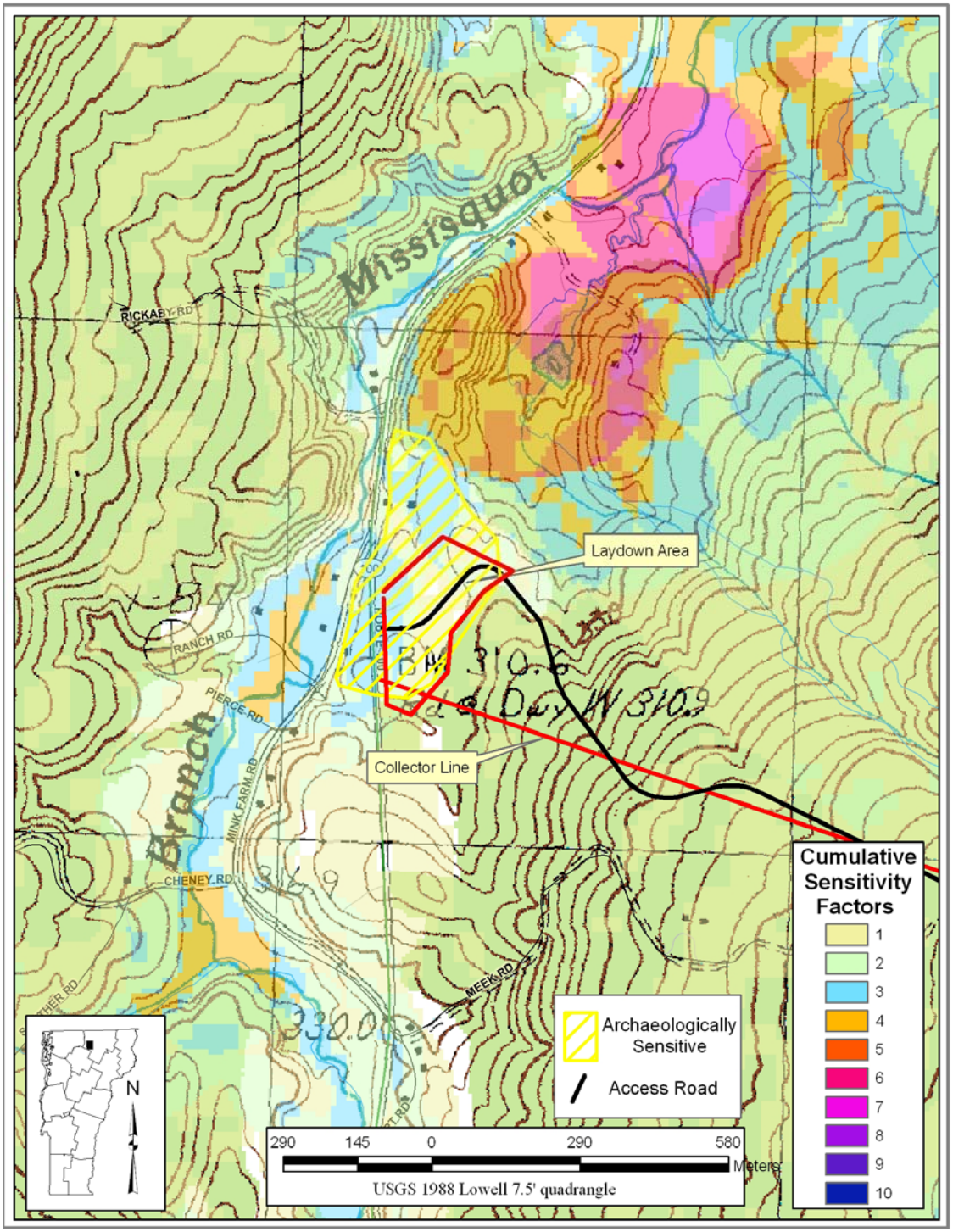

Figure 4. Map showing the location of the archaeologically sensitive portion of the proposed Kingdom Community Wind Project, Lowell, Orleans County, Vermont